OPERATING INSTRUCTIONS

for

GANGED VARIAC® AUTOTRANSFORMERS

TYPES V-2G2, V-2G3

Where operating requirements cannot be met by individual Variac® autotransformers, ganged units controlled by a single shaft will often provide a satisfactory solution. V-2 Variacs are available in two-gang and three-gang standard assemblies. These can be used in single phase or polyphase circuits to meet a variety of specialized requirements.

Single-Phase Circuits

When Variacs are operated in series, they can be used on circuits of twice the normal Variac voltage. Because there is no common connection between input and output of series operated Variacs, THE LOAD MUST NOT BE GROUNDED. Single-phase ratings and data are given in Table I, below.

TABLE I SINGLE-PHASE VARIACS AND VARIAC® ASSEMBLIES

		INPUT			OUTPUT							
					KVA		VOLTS		AMPERES		MINIMUM LOAD OHMS	
	TYPE	CONNECTION	See Fig.	LINE INPUT VOLTS	AT LINE INPUT VOLTS	AT MAX. VOLTS	LINE	MAX.	RATED	MAX.	AT LINE VOLTS	AT MAX. VOLTS
115-VOLT CIRCUITS	V-2	Single Unit	1a, 1b	115	.345	.270	0-115	0-135	2	3	38.3	67.5
230-VOLT CIRCUITS	V-2G2	Series	1c, 1d	230	.69	.54	0-230	0-270	2	3	76.7	135

SINCE 1915

MANUFACTURERS OF ELECTRONIC APPARATUS

FOR SCIENCE AND INDUSTRY

GENERAL RADIO COMPANY

275 MASSACHUSETTS AVENUE

CAMBRIDGE 39 MASSACHUSETTS

90 West St. New York 6, N. Y.

920 South Michigan Ave. Chicago 5, Illinois

8055 13th Street Silver Spring, Maryland

1000 North Seward St. Los Angeles 38, Calif.

Printed in U.S.A.

Open-delta and wye-connected Variacs can be used directly on three-phase lines. The open-delta connection permits operation to line voltage, Figure 2a, or to 117% of line voltage, Figure 2b.

Figure 3 shows a most useful Variac connection. Because the voltage across each leg of a wye-connected assembly is line volts divided by $\sqrt{3}$, and since V-2 Variacs are wound for 135 volts, it is possible to operate wye-connected V-2 Variacs from a 230 three-phase line, since 230 divided by $\sqrt{3}$ is 133. The overvoltage feature is sacrificed in this circuit, but the KVA rating is increased in the ratio of 133:115.

Figure 4 shows the two commonly encountered

TABLE II THREE-PHASE ASSEMBLIES

	TYPE	INPUT			OUTPUT							
					KVA		DELTA LOAD					
							OUTPUT VOLTS		AMPERES		MINIMUM OHMS	
		LINE VOLTS	CONNEC-TION	See Fig.	AT LINE VOLTS	AT MAX. VOLTS	LINE Connec.	OVERVOLT Connec.	RATED	MAX.	AT LINE VOLTS	AT MAX. VOLTS
115-VOLT CIRCUITS	V-2G2	115	Delta	2a, 2b	.6	.47	0-115	0-135	1.15	1.73	66.5	118
230-VOLT CIRCUITS	V-2G3	230	Wye	3	1.2		0-230		1.16	1.73	133	

CONNECTIONS FOR VARIACS OPERATED IN SERIES

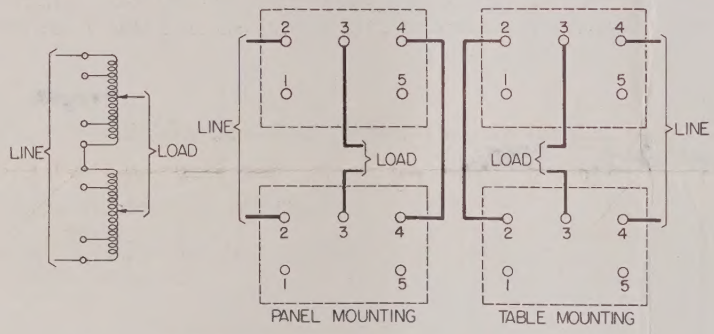


Figure Ic. LINE VOLTAGE CONNECTION: 230 VOLTS IN, 0-230 VOLTS OUT

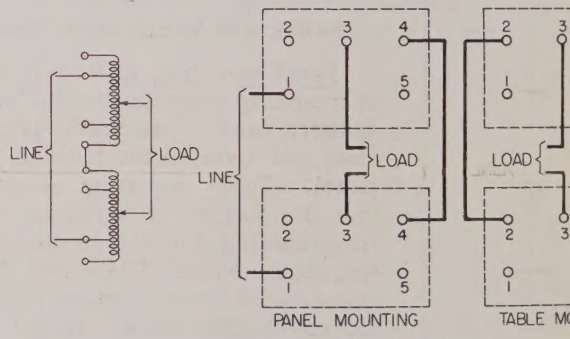


Figure Id. OVERVOLTAGE CONNECTION: 230 VOLTS IN, 0-270 VO

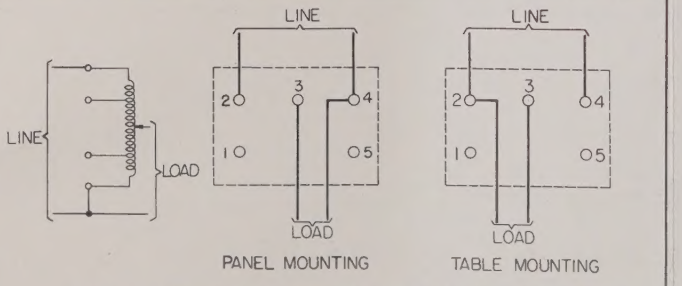


Figure Ia. LINE VOLTAGE CONNECTION: 115 VOLTS IN, 0-115 VOLTS OUT

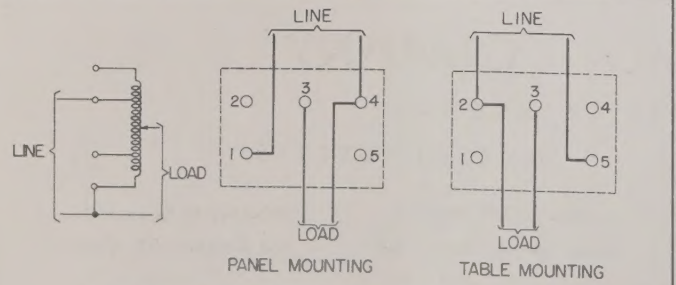
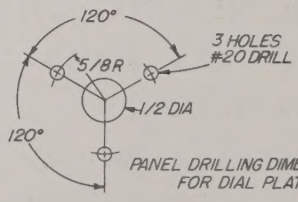
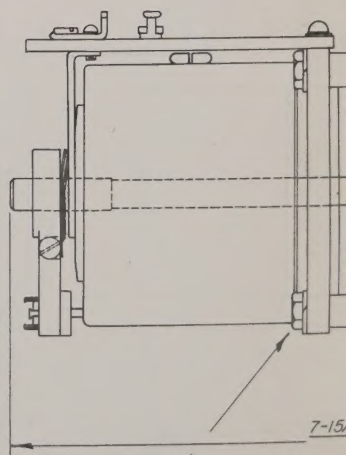


Figure Ib. OVERVOLTAGE CONNECTION: 115 VOLTS IN, 0-135 VOLTS OUT





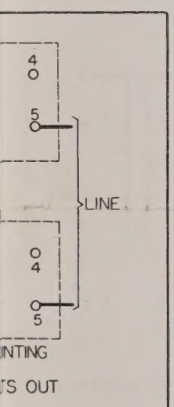
Four screw holes are prov
rear of the gang structure t
extra bracing that may be
some cases.

se Circuits

types of three-phase load. For equal loading of the supply Variac, $R_\Delta = 3R_Y$. R_Δ and R_Y are related to the single-phase load, R, by $\frac{R_\Delta}{\sqrt{3}} = R = \sqrt{3}\,R_Y$.

Table II, below, gives voltages, currents and circuits as well as minimum load impedance. Note that $V_\Delta = \sqrt{3}\,V_Y$ and $I_\Delta = \frac{I_Y}{\sqrt{3}}$.

WYE LOAD					
OUTPUT VOLTS		AMPERES		MINIMUM OHMS	
LINE Connec.	OVERVOLT Connec.	RATED	MAX.	AT LINE VOLTS	AT MAX. VOLTS
-66.5	0-78	2	3	22.2	39
-133		2	3	44.3	



PANEL AND TABLE MOUNTING

Panel mounting is that method of mounting wherein the Variac is secured back of the panel, with its shaft and knob on the front of the panel. Table mounting assumes that the Variac is operated with its mounting surface on the table top, shaft vertical. Diagrams show connections for clockwise voltage increase under these conditions.

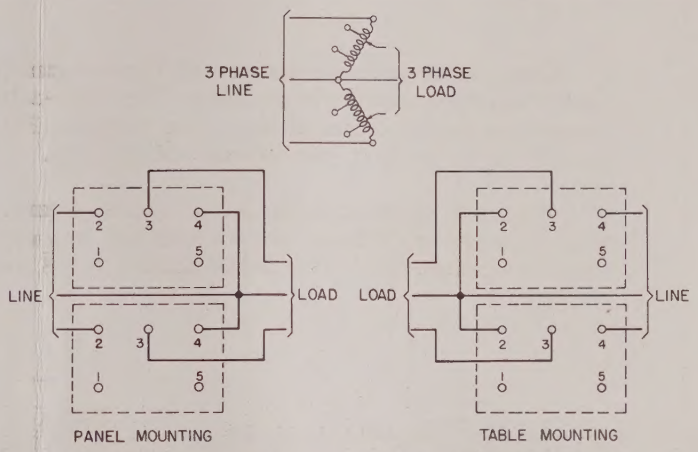


Figure 2a. LINE VOLTAGE CONNECTION
OPEN DELTA: 115 VOLTS IN, 0-115 VOLTS OUT

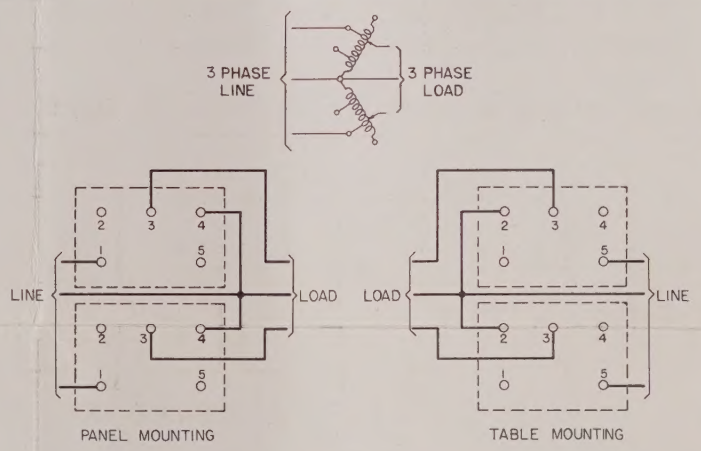
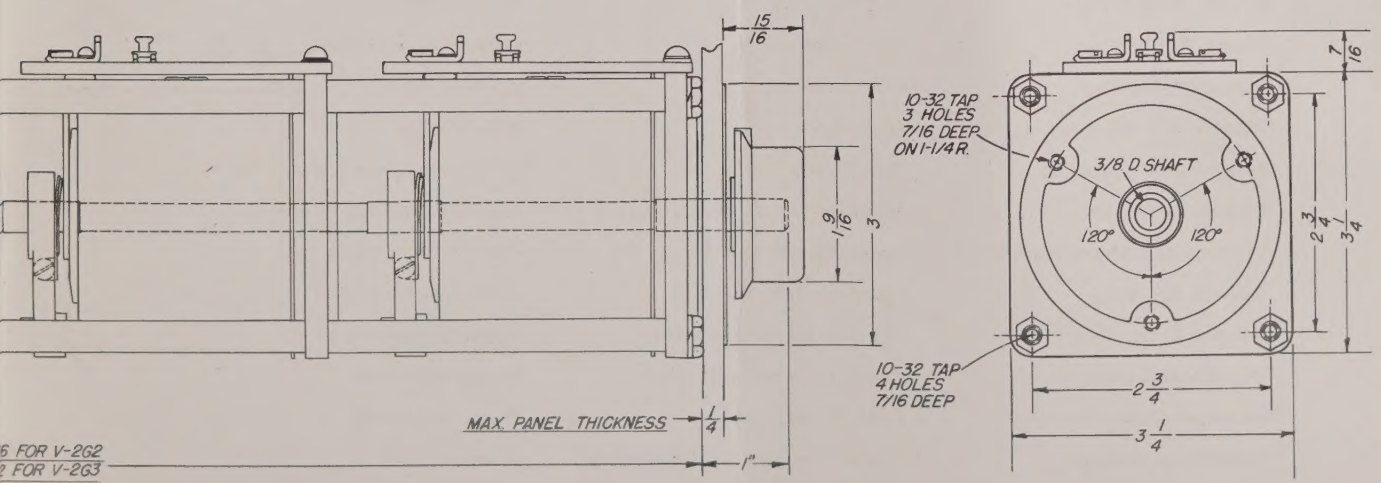


Figure 2b. OVER-VOLTAGE CONNECTION
OPEN DELTA: 115 VOLTS IN, 0-135 VOLTS OUT



ied at the
facilitate
esired in

DIMENSION DRAWING OF GANGED TYPE V-2 VARIACS

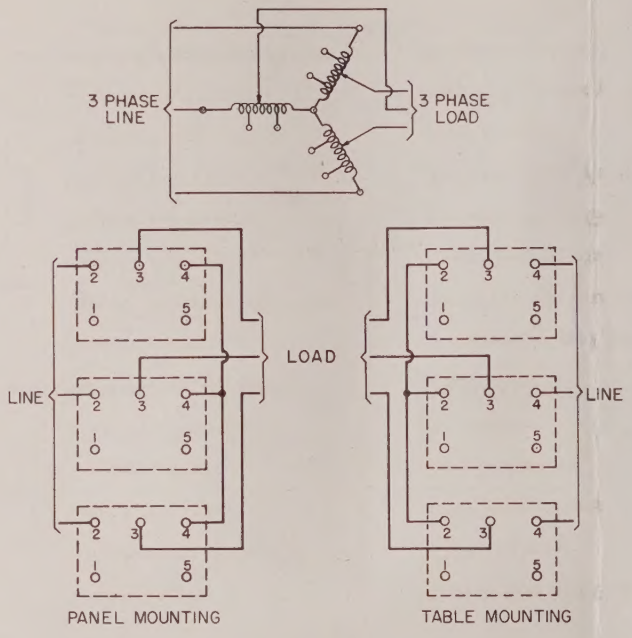


Figure 3. LINE-VOLTAGE CONNECTION, WYE: 230 VOLTS IN, 0-230 VOLTS OUT

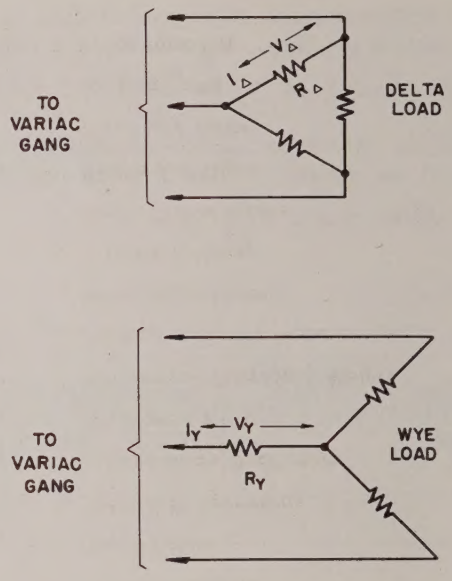


FIGURE 4

GENERAL RADIO COMPANY

Manufacturers of

Stroboscopes	U-H-F Coaxial Elements	Wave Analyzers
Sound-Level Meters	Slotted Lines	Wave Filters
Sound Analyzers	Unit Instruments	Frequency Standards
Vibration Meters	Null Detectors	Interpolation Oscillators
Vibration Analyzers	Amplifiers	Wavemeters
Motor Speed Controls	Oscillators	Heterodyne Frequency Meters
Polariscopes	Standard-Signal Generators	Audio-Frequency Meters
Variac® Autotransformers	Amplitude Modulators	Modulation Meters
Decade Resistors	Pulse Generators	Distortion Meters
Decade Capacitors	Random Noise Generators	Audio Transformers
Decade Inductors	Vacuum-Tube Voltmeters	Knobs and Dials
Precision Capacitors	Light Meters	Plugs and Jacks
Impedance Bridges	Audio-Frequency Microvolters	Binding Posts
U-H-F Admittance Meters	Megohmmeters	Potentiometers

Form 861-A
September, 1954